

CLAIMS

1. Folding machine for folding a web material (N) along transverse folding lines, comprising at least one folding cylinder (1, 3; 505) equipped with at least one gripping member (43; 513) to grasp the web material (N) along a  
5 folding line;  
characterized in that an electrostatic system is associated with said at least one gripping member (43; 513) to attract the web material towards said gripping member (43; 513).
2. Machine as claimed in claim 1, characterized by a system (101)  
10 to electrostatically charge the web material (N) before it reaches said gripping member.
3. Machine as claimed in claim 1 or 2, characterized in that it comprises two counter-rotating folding cylinders (1, 3), with parallel axes, each equipped with at least one gripping member (43) and with a relative  
15 electrostatic system.
4. Folding machine as claimed in one or more of the previous claims, characterized in that said gripping member (43; 513) comprises a movable element (61) cooperating with a first stop, the web material being electrostatically attracted between said movable element (61) and said stop.
- 20 5. Folding machine as claimed in claim 4, characterized in that said stop is held at an electrostatic potential of the opposite sign with respect to the electrostatic potential of said web material.
6. Folding machine as claimed in claim 5, characterized in that said movable element (61) cooperates with a second stop (63), said first and said  
25 second stop defining a slot essentially parallel to the axis of rotation (1A, 3A; 505A) of the respective folding cylinder, the movable element (61) extending in said slot.
7. Folding machine as claimed in one or more of the previous claims, characterized in that each of said folding cylinders (1, 3) comprises at  
30 least one cavity (41) essentially parallel to the axis of rotation (1A, 3A) thereof and open onto the cylindrical surface of the folding cylinder, inside which the respective gripping member (43) is housed, and in that at least one retaining member kept at an electrostatic potential to cause attraction of the web material is housed in said cavity.

8. Folding machine as claimed in claims 5 and 7, characterized in that a first block (65) defining said first stop is fixed in said cavity (41).

9. Folding machine as claimed in at least claims 6 and 7, characterized in that a second block (63) defining said second stop (73) is  
5 fixed in said cavity (41).

10. Folding machine as claimed in one or more of the previous claims, characterized in that each of said gripping members (43) comprises an elastic plate (61).

11. Folding machine as claimed in one or more of the previous  
10 claims, characterized in that a cutting unit (501, 503) is associated with said folding cylinder (505) to cut the web material (N) into individual sheets, which are folded by said folding cylinder.

12. Folding machine as claimed in claim 11, characterized in that  
15 said cutting unit comprises two cylinders with axes parallel to each other and to the folding cylinder, which are counter-rotating (501, 503) and define therebetween a nip through which the web material passes, and equipped with blades and counter-blades (509, 511) to cut the web material (N), and in that one of said two counter-rotating cylinders (501, 503) forming the cutting  
20 unit forms together with the folding cylinder a nip through which the cut web material passes.

13. Folding machine as claimed in one or more of the previous claims, characterized in that said at least one folding cylinder (1; 3; 505) cooperates with a counter-cylinder (3; 1; 503), on which a boss (201A) is provided, extending parallel to the axis of said cylinders, the boss being  
25 phased with respect to the gripping member, to facilitate folding of said web material (N).

14. Folding machine as claimed in claims 3 and 13, characterized in that provided on each of said folding cylinders is a corresponding boss (201A), each boss (201A) of one of said folding cylinders (1, 3) cooperating  
30 with a gripping member of the opposite folding cylinder.

15. A method for folding a web material according to transverse folding lines, comprising the steps of:

- arranging at least a first folding cylinder (1);
- providing, on said folding cylinder, at least one gripping member (43);

- rotating said folding cylinder about an axis thereof;
- feeding the material to said folding cylinder;
- engaging the web material with said at least one gripping member of said folding cylinder;

5    **characterized in that** the web material is inserted into said gripping member by means of electrostatic attraction.

10    16.    Method as claimed in claim 15, characterized by arranging two counter-rotating folding cylinders with parallel axes, defining a nip through which the web material is made to pass, each of said folding cylinders being equipped with at least one gripping member, and by engaging the web material alternately with a gripping member (43) of the first folding cylinder (1) and with a gripping member of the second folding cylinder (3), to fold said web material with a zigzag configuration.

15    17.    Method as claimed in claim 15 or 16, characterized in that the web material is gripped between a stop fixed with respect to the relative folding cylinder (1, 3) and a movable element (61).

18.    Method as claimed in one or more of claims 16 to 18, characterized in that folding is facilitated in said web material in front of said gripping member.

20    19.    Method as claimed in claim 18, characterized in that folding is facilitated by means of a boss (201A) provided on a cylinder (3; 503) opposite said at least one folding cylinder (1).

20.    Method as claimed in claim 18 or 19, characterized in that said gripping member does not cooperate mechanically with said boss.